DESIGN AND IMPLEMENTATION ON REMOTE ACCESS TO IMPROVE ATM SECURITY BY USING IOT

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Abstract— In this project we proposes a secured ATM (Automated Teller Machine) system using a card scanning system along with LINK system for improved security. Usual ATM systems do not contain the LINK feature for money withdrawal. If an attacker manages to get hold of ATM card and the pin number, he may easily use it to withdraw money fraudulent. So our proposed system supports the ATM card scanning system along with an LINK system. This user may scan his card and login to the system. But after user is through with this authentication he may view details but is asked to enter LINK as soon as he clicks money withdrawal option. At this stage the system generates and sends an LINK to the registered mobile number to that particular user. The password is generated ad sent to the user mobile phone. He now needs to enter the LINK in the system in order to withdraw money. Thus our system provides a totally secure way to perform ATM transactions with two level security structure.

Keywords:Batch Processing,Integrated Development Enviroment(IDE), FPGA(Field Programming Gate Array),RFID and Prospice Simulations models.

I. INTRODUCTION

To develop the project to provide remote access to improve ATM Security by using Internet of Things. Nowadays, using the ATM (Automatic Teller Machine) which provides customers with the convenient banknote trading is very common. A lot of criminals tamper with the ATM terminal and steal user's credit card and password by illegally. Once user's bank card is lost and the password is stolen, the criminal will draw all cash in the shortest time, which will bring enormous financial losses to customer. Anyone who knows the PIN and have the ATM card can easily access the user account. To overcome the disadvantages of inserting the ATM card into the ATM machine, RFID card is used. It reads the user information by sensing and it also manages different banks accounts in a single RFID card. The GSM is used to improve the security by providing OTP and also informs the user by an SMS in case the entered password is wrong.

II. PROPOSED SYSTEM

The proposed system aims to solve all this by constant updating of bank records. The Java based construction of the system will enable transactions at any bank or ATM to be registered within a matter of seconds. Security of these details is also a top priority in this system. This central hub will be accessed by an ATM for secure customer transactions. In our project we are going to place an extra button in ATM machines. When that button got pressed the control window will be telecasted to accountant cellular phone.

Then the accountant can enter the pin and amount manually in his mobiles telecasted pop-up window. By this control system accountant can keep his pin number with him and he can vend the amount by his own control by the desired person. While in online signature verification uses dynamic characters that is dynamic time dependent of the signature to authenticate the signer. This paper describes the implementation on field programmable gate arrays (FPGAs) of an embedded system for online signature verificationThe Arduino Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC-to-DC adapter (wall- wart) or battery. The adapter can be connected by plugging a 2.1mm centre-positive plug into the board's power jack.
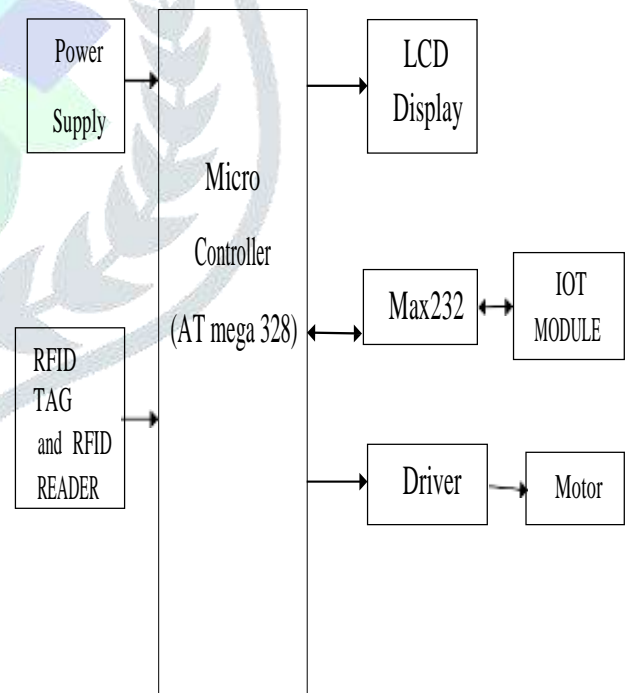
III. BLOCK DIAGRAM
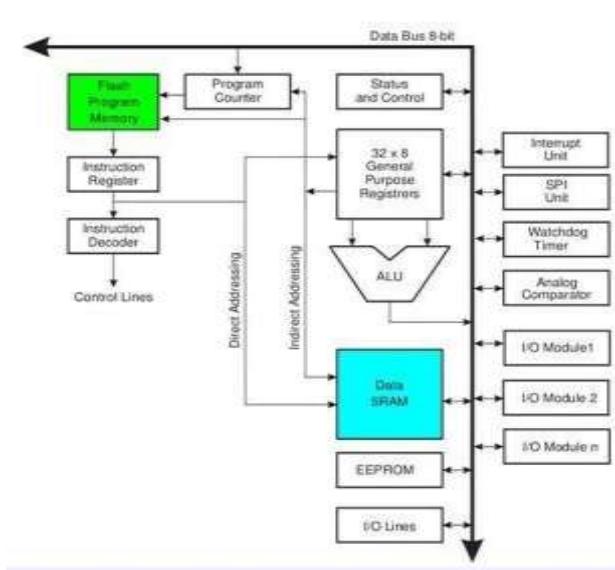

FIGURE 1. BLOCK DIAGRAM

IV. HARDWARE DIAGRAM

FIGURE 2. HARDWARE DIAGRAM.

V. EXISTING SYSTEM

The existing ATM Simulation System was built for the original concept of regional private banks. Small banks in villages and towns will service the needs of the local community and will only require ledgers to record account details.This system was augmented with the introduction of excel sheets and emails. Banks could now record all information in an excel sheet and then set an update schedule when they will mail all records to a central hub where these records will again be proposed.

V. HARDWARE DESCRIPTION

The project's board designs use a variety of microprocessors and controllers. These systems provide sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards ("shields") and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, for loading programs from personal computers. The microcontrollers are mainly programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler toolchains, the Arduino project provides an integrated development environment (IDE) based on the Processing language project. An ATmega8U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. The '8U2 firmware uses the standard USB COM drivers, and no external driver is needed. The RX and TX LEDs on the board will flash when data is being transmitted via the USB-to-serial chip and USB connection to the computer (but not for serial communication on pins 0 and 1).A Software Serial library allows for serial communication on any of the Uno's digital pins. The ATmega328 also supports I2C (TWI) and SPI communication. The Arduino software includes a Wire library to simplify use of the I2C bus; see the documentation for details. For SPI communication, use the SPI library. The project's board designs use a variety of microprocessors and controllers. These systems provide sets of digital and

analog input/output (I/O) pins that may be interfaced to various expansion boards ("shields") and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, for loading programs from personal computers. The microcontrollers are mainly programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler toolchains, the Arduino project provides an integrated development environment (IDE) based on the Processing language project. Arduino is a computer hardware and software company, project, and user community that designs and manufactures microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. The project's products are distributed as open-source hardware and software, which are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL),[1] permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form, or as do-it-yourself kits.

VI. SOFTWARE DESCRIPTION

Embedded systems are more tied to the hardware. Two salient features of Embedded Programming are code speed and code size. Code speed is governed by the processing power, timing constraints, whereas code size is governed by available program memory and use of programming language. Goal of embedded system programming is to get maximum features in minimum space and minimum time. The ISIS Intelligent Schematic Input System (Intelligent Switching input system), is the environment for the design and simulation of electronic circuits. Assembly language seems to be an obvious choice for programming embedded devices. However, use of assembly language is restricted to developing efficient codes in terms of size and speed. Also, assembly codes lead to higher software development costs and code portability is not there. Developing small codes are not much of a problem, but large programs/projects become increasingly difficult to manage in assembly language. Finding good assembly programmers has also become difficult nowadays. Hence high level languages are preferred for embedded systems programming. Use of C in embedded systems is driven by following advantages it is small and reasonably simpler to learn, understand, program and debug. The component library includes claims more than 10,000 circuit components with 6000 Prospice Simulations models. Own components can be created and added to the library. Here we use Proteus PCB design electronic circuits can computer-aided design and circuit boards are designed. Proteus 7.0 is the program to use when you want to simulate the interaction between software running on a microcontroller and any analog or digital electronic device connected to it. . Proteus VSM comes with extensive debugging features, including breakpoints, single stepping and variable display for a neat design prior to hardware prototyping. In addition to the object file, the compiler generates a listing file which may optionally include symbol table and cross reference information. As assembly language programs are specific to a processor, assembly language didn't offer portability across systems. To overcome this disadvantage, several high level languages, including C,

came up. Some other languages like PLM, Modula-2, Pascal, etc. also came but couldn't find wide acceptance. Amongst those, C got wide acceptance for not only embedded systems, but also for desktop applications.The Arduino Uno can be programmed with the Arduino software. Select "Arduino Uno from the Tools > Board menu (according to the microcontroller on your board). For details, see the reference and tutorials. The ATmega328 on the Arduino Uno comes preburned with a boot loader that allows you to upload new code to it without the use of an external hardware programmer. It communicates using the original STK500 protocol (reference, C header files). You can also bypass the boot loader and program the microcontroller through the ICSP (In-Circuit Serial Programming) header; see these instructions for details. One of the main components of Proteus 7.0 is the Circuit Simulation -- a product that uses a SPICE3f5 analogue simulator kernel combined with an event-driven digital simulator that allow users to utilize any SPICE model by any manufacturer. Proteus VSM comes with extensive debugging features, including breakpoints, single stepping and variable display for a neat design prior to hardware prototyping. This is the perfect tool for engineers to test their microcontroller designs before constructing a physical prototype in real time. This program allows users to interact with the design using on-screen indicators and/or LED and LCD displays and, if attached to the PC, switches and buttons.

FIGURE 3. SIMULATION

VII. WORKING

Traditional ATM systems authenticate generally by using the credit card and the password, the method has some defects. Using credit card and password cannot verify the client's identity exactly. Anyone who knows the PIN and have the ATM card can easily access the user account. This paper describes a new method combining with the traditional method. Here RFID and GSM is used to improve the security of the transaction. To overcome the disadvantages of inserting the ATM card into the ATM machine, RFID card is used. It reads the user information by sensing and it also manages different banks accounts in a single RFID card. The accountant can enter the pin and amount manually in his mobiles telecasted pop-up window. After scanning RFID card in ATM center, the accountant get a link in the form of SMS. Through this link the user can withdraw the amount safely. The user can accesses the link and login with their user name and password which they integrated with the bank. A page will display in the user mobile phone. They can choose how much amount they going to withdraw from their account. By this control system accountant can keep his pin number with him and he can vend the amount by his own control by the desired person. In our project we are going to place an extra

button in ATM machines. When that button got pressed the control window will be telecasted to accountant cellular phone. The GSM is used to improve the security by providing OTP and also informs the user by an SMS in case the entered password is wrong. The user can easily withdraw the amount safely by using this method.

VIII.LIST OF COMPONENTS

1. Arduino Microcontroller
2. RFID tag
3. RFID reader
4. MAX 232
5. GSM
6. LCD

IX.EXPLANATION OF EACH COMPONENTS

Arduino UNO: The Arduino Uno is an open-source Microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output pins that may be interfaced to various expansion boards and other circuits. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the ATmega16U2(ATmega16U2) programmed as a USB-to-serial converter.
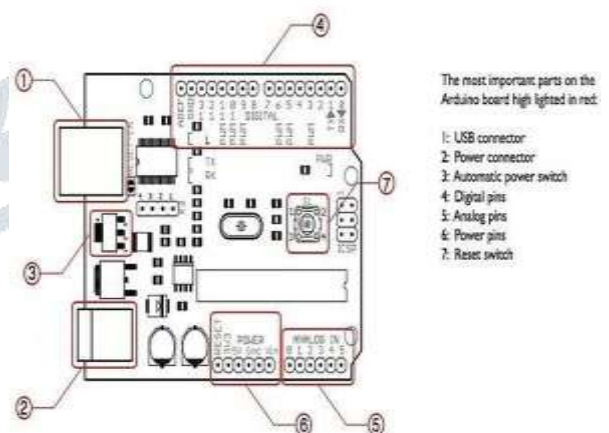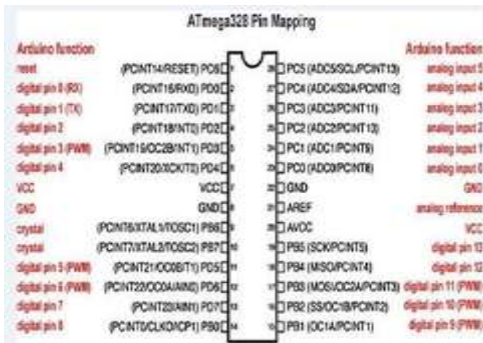

FIGURE 4. Arduino UNO R3 Microcontroller

FIGURE 5. ATmega328 pin diagram

RFID Tag: Radio-frequency identification uses electromagnetic fields to automatically identify and radio transponder, a radio receiver and transmitter.

RFID Reader: An RFID reader is the brain of the RFID system and is necessary for any system to function. Readers, also called interrogators,are devices that transmit and receive radio waves in order to communicate with RFID tag.

MAX 232: The MAX232 is an integrated circuit first created in 1987 by Maxim Integrated Products that converts signals from a TIA-232 serial port to signals suitable for use in TTL-compatible digital logic circuits. The MAX232 is a dual transmitter / dual receiver that typically is used to convert the RX, TX, CTS, RTS signals.

GSM: The Global System for Mobile Communications is a standard developed by the European Telecommunications Standards Institute to describe the protocols for second-generation digital cellular networks used by mobile devices such as mobile phones and tablets. It was first deployed in Finland in December 1991.

LCD: A liquid-crystal display is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizers. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome.

X.BATCH PROCESSING

Batch processing is a processing of transaction in a group or batch no user interaction is require once batch processing is underway. This differentiates batch processing from transaction processing, which involves transaction one at time**.** The idea of designing and implementation of security based ATM theft project is born with the observation in our real life incidThis system uses ARM controller based embedded system to process real time data collected using the vibration sensor once the vibration is sensed . DC motor is used for sending messages and it sends the message to the ATM users mobiles about corresponding bank through the GSM. When that button got pressed the control window will be telecasted to accountant cellular phone.Then the accountant can enter the pin and amount manually in his mobiles telecasted pop-up window. By this control system accountant can keep his pin number with him and he can vend the amount by his own control by the desired person.
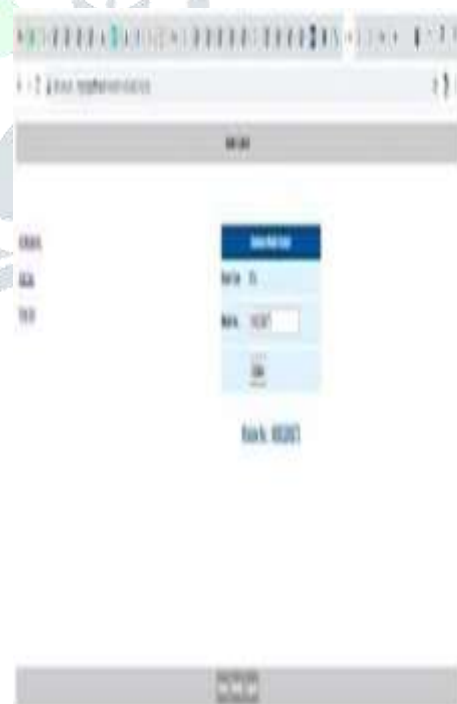

FIGURE 6. BATCH PROCESSING

XI.HARDWARE KIT

FIGURE 7. HARDWARE KIT

The above figure shows the real hardware components of our project. Our project was designed using FPGA concept. By using this concept we can able to improve ATM security.

XII.RESULT ANALYSIS

Proteus VSM comes with extensive debugging features, including breakpoints, single stepping and variable display for a neat design prior to hardware prototyping. When that button got pressed the control window will be telecasted to accountant cellular phone. Then the accountant can enter the pin and amount manually in his mobiles telecasted pop-up window. By this control system accountant can keep his pin number with him and he can vend the amount by his own control by the desired person.
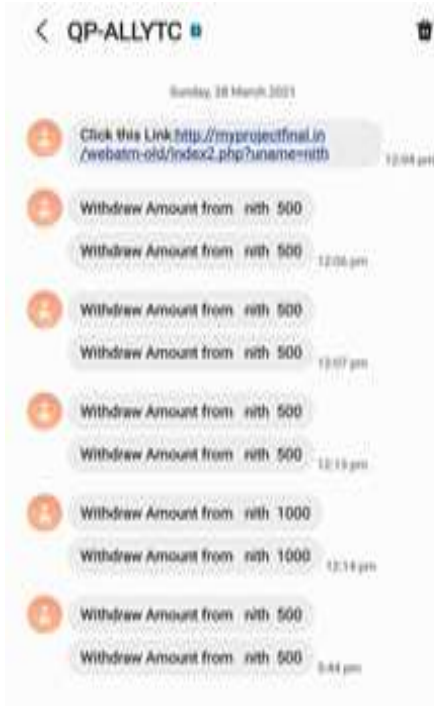

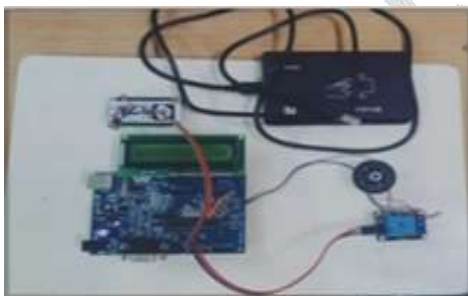FIGURE 8.RESULT ANALYSIS

XIII.FINAL OUTCOME OF PROJECT

FIGURE 9. FINAL OUTCOME OF PROJECT

XIV.FUTURE ENHANCEMENT

As per RBI, for ATM industry, India is a huge market. It is a place with 1.2 billion people, where 40% of them were unbanked. ICICI Bank general manager OP Srivastava once commented: "When we saw a man in a dhoti in a remote town in South India withdraw money from an ATM, tuck it in the folds and ride away on his cycle, we were truly inspired by the ATM growth in the country." There is a huge opportunity for growth of ATM market in India. The future will see multi vendor ATM popularity, which will provide personalized features and a user friendly interface. ATM will be a popular "Public Technology".Modern ATMs are now capable of personalized branding.

XV.CONCLUSION

This whole implementation ensures us a secured and authenticated transaction through RFID and GSM technique with lowest cost and minimum maintenance. Mankind will utilize new and secured type of money transactions. The only thing is that initial cost of RFID conversion of the entire system is the required one time investment. The value added service that this system provides increases the credibility of the financial institutions, the banks improves the convenience to its customer. Hence as the world progresses through the inevitable and an indomitable quest for knowledge, the aspect of security bound systems are bound to concede with the growing innovations and obviously more vulnerabilities. Hence our application might well solve the aspect of transaction security to a precise and great extent.

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